

## CLAIMS

What is claimed is:

1. A communication station for increasing the capacity of a communication system, the communication station comprising:

an antenna system comprising:

a plurality of antennas for providing a plurality of copies of a received signal;

a plurality of delay units to provide a specific time delay to at least one of the signals received by the plurality of antennas; and

a summation unit to generate summation of the signals received by the antennas and selectively delayed by the delay units, whereby the summation of the signals has a known phase distortion corresponding to the at least one time delay; and

a modem configured to compensate for the known phase distortion for demodulating an individual communication signal associated with a unique code from a signal output by the antenna system.

2. The communication station of claim 1 wherein the time delay is adjustable.

3. The communication station of claim 1 wherein three antennas and two delay units are provided to generate three copies of a signal.

4. The communication station of claim 3 wherein the first delay unit delays the signal received by the second antenna, and the second delay unit delays the signal received by the third antenna.

5. The communication station of claim 4 wherein the first delay unit delays three chips with respect to the signal received by the first antenna, and the

second delay unit delays seven chips with respect to the signal received by the second antenna.

6. The communication station of claim 1 wherein the modem includes a vector correlator for generating filter coefficients based on signal distortion; the vector correlator having a processing capacity sufficient to cover the time delay, whereby the vector correlator compensates for the known phase distortion and for multipath distortion ascertainable within its processing capacity; and

an adaptive matched filter that is configured to process communication signals with the unique code using coefficients generated by the vector correlator.

7. The communication station of claim 6 wherein the modem further comprises an automatic power control unit associated with the adaptive match filter for generating return power control signals for transmission.

8. The communication station of claim 1 wherein the antennas are spaced at least six wavelengths apart from each other.

9. The communication station of claim 1 wherein the antennas are spaced no more than three yards apart from each other.

10. The communication station of claim 1 wherein the modem is coupled with the antenna system via a receiver which is configured to strip a carrier frequency from the antenna system output signal.

11. The communication station of claim 10 wherein the receiver and the modem are located in physically separate units and coupled through a cable which provides power to the receiver.

12. The communication station of claim 11 wherein the cable is at least 20 feet long.

13. A method for processing received wireless signals in a communication system, the method comprising:

creating a plurality of copies of a received signal;

providing a specific time delay to at least one of the copies of the signal;

summing the plurality of copies so as to provide a combined output signal having a known phase distortion corresponding to the time delay; and

demodulating an individual communication signal associated with a unique code from the combined output signal based in part on the known phase distortion.

14. The method of claim 13 wherein a plurality of antennas are used to create the plurality of copies of the received signal.

15. The method of claim 13 wherein the time delay is adjustable.

16. The method of claim 13 wherein three antennas are provided to generate three copies of signal and two copies of the signal are delayed by two delay units respectively.

17. The method of claim 16 wherein the second copy is delayed three chips with respect to the first copy, and the third copy is delayed seven chips with respect to the second copy.